PART V—APPLICATION REVIEW REQUIREMENTS

A. General

We evaluate each application in a 2-part process. First, we screen each application to ensure that it meets the administrative requirements as set forth in the Request for Applications (RFA). Second, a scientific peer review process evaluates technical aspects of the applications to meet these requirements, using either a review panel described in the next two paragraphs or, for select Foundational Program Area Priorities, the Distributed Peer Review process described in section 0, below.

We select reviewers based on their training and experience in relevant scientific, extension, and/or education fields, taking into account the following factors: (a) The level of relevant formal scientific, technical education, or extension experience of the individual, as well as the extent to which an individual is engaged in relevant research, education, and/or extension activities; (b) the need to include, as reviewers experts from various areas of specialization within relevant scientific, education, and/or extension fields; (c) the need to include as reviewers other experts (e.g., producers, range or forest managers/operators, and consumers) who can assess relevance of the applications to targeted audiences and to program needs; (d) the need to include as reviewers experts from a variety of organizational types (e.g., colleges, universities, industry, state and federal agencies, and private profit and non-profit organizations) and geographic locations; (e) the need to maintain a balanced composition of reviewers with regard to minority and female representation and an equitable age distribution; and (f) the need to include reviewers who can judge the effective usefulness of each application to producers and the general public.

When each peer review panel has completed its deliberations, the responsible program staff of each program area priority will recommend that the project: (a) be approved for support from currently available funds or (b) be declined due to insufficient funds or unfavorable review.

Program Area Priorities reserve the right to negotiate with the Project Director (PD) and/or with the submitting organization or institution regarding project revisions (e.g., reductions in the scope of work, funding level, period, or method of support) prior to recommending any project for funding.

B. Distributed Peer Review (being piloted for select program area priorities in the Foundational Program)

In FY 2016, the Agriculture and Food Research Initiative (AFRI) is piloting a modified peer-review process for three select program area priorities in the Foundational Program (see Foundational Program RFA for the specific program area priorities using this review mechanism). The National Science Foundation piloted this same process in 2014, with NIFA participation (see Science Insider).

Submission of a standard grant application (i.e., Standard, Strengthening Standard or New

Investigator grant application) to any of these three program area priorities will imply your willingness to participate in the Distributed Peer Review process. Please note that conference, seed, sabbatical, and equipment grant applications will not be part of this pilot, so if submitting one of those project types, you will <u>not</u> be participating in this process, and your application will be reviewed using traditional peer-review mechanism.

1. The purpose of this pilot is to seek new approaches to review of applications that improve the quality of reviews, reduce the time between RFA closing and applicant notification, reduce the workload on the reviewer community, and potentially lower the cost of the review process, while continuing to maintain the quality and integrity of NIFA's peer review system and to encourage the submission of collaborative or highly innovative applications. Briefly, the review process shall consist of the following:

    a. All proposals will be subject to *ad hoc* review only. There will be no panel review of these applications.
    b. All applications submitted to a select program area priority will be organized into clusters consisting of approximately 25 to 40 applications.
    c. **Each PD whose application is assigned to a cluster will be assigned to review and rank seven other applications also within that cluster.** Review assignments will be made so as to avoid organizational or individual conflicts of interest.
    d. All PDs must complete their review and ranking of the seven assigned applications within 30 days from the date of their assignment. **Failure to complete this review and ranking within the allotted time will result in the disqualification of the PD's own application from the peer-review process.**
    e. A composite ranking of all applications in each cluster will be determined, and each PD's application rank will be adjusted based on a measure of the consensus agreement of the reviews provided by the PD. By striving to align their ranking of reviewed applications with the overall composite ranking of those same applications, each applicant can receive a small increase in rank for their proposal. The adjustment is designed to provide an incentive for unbiased reviews and rankings that lead to overall consensus among the reviewers. If all reviewers do an equally good job of achieving consensus with the other reviewers, there will be no change in the composite ranking. Because this incentive produces only a moderate adjustment of rank, it can only alter recommendations for the applications near the funding line, when they have essential indistinguishable scientific merit.
    f. Final aggregation of applications across clusters and award/declination recommendations will be performed as is currently done, and as described under [A], above.

    Anonymity of reviewers will be preserved, as PDs will not know which of the other PDs review their application.

2. **Theoretical Basis**

    The theoretical basis for the proposed review process lies in an area of mathematics referred to as mechanism design or, alternatively, reverse game theory. In mathematics, a game is defined as any interaction among two or more people. The purpose of

mechanism design is to enable one to "design" the "mechanism," namely the game, to obtain the desired result, in this case to efficiently obtain high-quality application review while providing the advantages noted above. In mechanism design, this is done by formulating a set of incentives that drive behavior in the desired direction. Michael Merrifield and Donald Saari devised the mechanism presented here[1]. The detailed description of the process and algorithms used will be provided on the NIFA website for distributed peer review.

3. **The Process**

   The proposed pilot review process is as follows:

   a. Upon receipt of applications in each of the three programs listed above, each cognizant National Program Leader (NPL) will organize his/her program's applications into sets comprising specific sub-fields. Each such set of n applications will comprise a "cluster." A typical cluster will contain 25-40 applications. Depending on the number of applications received by each program, it is possible that one or more of the three programs will only have one cluster.
   b. Using software that NIFA developed for the 2014 NSF pilot test, the NPL will randomly assign to each PD in each cluster a subset of m applications to be reviewed by that PD. For this pilot, $m=7$. In the event that a PD submits multiple applications, he/she will be assigned to review 7 applications for each application submitted[2].
   c. Based on the conflict-of-interest lists provided in each application, the random assignment process will block PDs with potential conflicts (either institutional or personal) from reviewing conflicted applications.
   d. Each PD will then review the assigned subset of m applications, provide a detailed written review and score (Poor-to-Excellent) for each, checking the appropriate boxes for Center of Excellence criteria, and rank ordering the applications in his/her subset by placing the applications in the order in which the PD thinks the group as a whole will rank them, *not in the order of his/her personal preference*. Failure to provide both written reviews and ranking by the specified date will automatically disqualify a PD's application from further consideration. PDs will be given 30 calendar days to complete their review and ranking of the applications to which they are assigned. PDs are not permitted to communicate with each other regarding this process or any application's content, and they are not informed of who is reviewing their applications. As with all agency peer review, reviewers will be asked to agree to confidentiality requirements.
   e. PDs who have not completed their reviews within the allotted time will have their applications returned as not in compliance with the program announcement, and they will not receive reviews if any have been completed for their application.
   f. The individual rankings provided by the PDs will be combined to produce a global ranking for the cluster.

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[1] M. Merrifield and D. Saari, *Telescope Time Without Tears: a Distributed Approach to Peer Review*, Astronomy and Geophysics, Vol. 50, Issue 4, July 20, 2009, pp. 4.2-4.6.
[2] In the case of an application with multiple PDs, the team will be asked to designate one person—a PD or co-PD—who will represent the team in the review process. This person is hereafter referred to as the "PD." Only this person from each team will participate in the application review process.

g. Each individual PD's rankings will be compared to the global ranking, and the rank of the PD's application will be adjusted in accordance with the degree to which his/her ranking matches the global ranking. *This adjustment provides an incentive to each PD to make an unbiased and thorough assessment of the applications to which they are assigned.*

h. The NPL then uses rankings from the various clusters, as input for award/declination recommendations, and documents his/her recommendations in accordance with current NIFA practices.

C. Evaluation Criteria

Projects supported under the AFRI program shall be designed, among other things, to accomplish one or more of the purposes of agriculture research, education, and extension, subject to the varying conditions and needs of States. Therefore, in carrying out its review, the peer review panel will take into account the following factors.

1. Research Project Applications
These evaluation criteria will be used for the review of all single-function Research Project applications.

   a. Scientific Merit of the Application for Research
      1. Novelty, innovation, uniqueness, and originality;
      2. Where model systems are used, ability to transfer knowledge gained from these systems to organisms of importance to U.S. agriculture;
      3. Conceptual adequacy of the research and suitability of the hypothesis, as applicable;
      4. Clarity and delineation of objectives;
      5. Adequacy of the description of the undertaking and suitability and feasibility of methodology;
      6. Demonstration of feasibility through preliminary data; and
      7. Probability of success of the project is appropriate given the level of scientific originality, and risk-reward balance.

   b. Qualifications of Project Personnel, Adequacy of Facilities, and Project Management
      1. Qualifications of applicant (individual or team) to conduct the proposed project, including performance record and potential for future accomplishments;
      2. Demonstrated awareness of previous and alternative approaches to the problem identified in the application;
      3. Institutional experience and competence in subject area;
      4. Adequacy of available or obtainable support personnel, facilities, and instrumentation; and
      5. Planning and administration of the proposed project, including: time allocated for systematic attainment of objectives; and planned administration of the proposed project and its maintenance, partnerships, collaborative efforts, and the planned dissemination of information for multi-institutional projects over the duration of the project.

c. Project Relevance
   1. Documentation that the research is directed toward specific Program Area Priority identified in this RFA and is designed to accelerate progress toward the productivity and economic, environmental, and social sustainability of U.S. agriculture with respect to natural resources and the environment, human health and well-being, and communities.

d. Center of Excellence Status
   1. All eligible applicants will be competitively peer reviewed (as described in Part V, A. and B. of this RFA), and ranked in accordance with the evaluation criteria. Those that rank highly meritorious and requested to be considered as a center of excellence will be further evaluated by the peer panel to determine whether they have met the standards to be centers of excellence (Part III D. and Part IV C.). In instances where they are found to be equally meritorious with the application of a non-center of excellence, based on peer review, selection for funding will be weighed in favor of applicants meeting the center of excellence criteria. NIFA will effectively use the center of excellence prioritization as a "tie breaker". Applicants that rank highly meritorious but who did not request consideration as a center of excellence or who are not deemed to have met the centers of excellence standards may still receive funding.

   In addition, the applicant's Notice of Award will reflect that, for the particular grant program, the applicant meets all of the requirements of a center of excellence. Entities recognized as centers of excellence will maintain that distinction for the duration of their period of performance or as identified in the terms and conditions of that award.

2. Integrated Project Applications
These evaluation criteria will be used for the review of all multi-function Integrated Project applications.

a. Merit of the Application for Science Research, Education, and/or Extension
   1. Project objectives and outcomes are clearly described, adequate, and appropriate. All project components (i.e., research, education, extension) – at least two are required – are reflected in one or more project objectives;
   2. Proposed approach, procedures, or methodologies are innovative, original, clearly described, suitable, and feasible;
   3. Expected results or outcomes are clearly stated, measurable, and achievable within the allotted time frame;
   4. Proposed research fills knowledge gaps that are critical to the development of practices and programs to address the stated problem or issue;
   5. Proposed extension leads to measurable, documented changes in learning, actions, or conditions in an identified audience or stakeholder group; and
   6. Proposed education (teaching) has an impact upon and advances the quality of food and agricultural sciences by strengthening institutional capacities and

curricula to meet clearly delineated needs and train the next generation of scientists and educators.

b. Qualifications of Project Personnel, Adequacy of Facilities, and Project Management
   1. Roles of key personnel are clearly defined;
   2. Key personnel have sufficient expertise to complete the proposed project, and where appropriate, partnerships with other disciplines (e.g., social science or economics) and institutions are established;
   3. Evidence of institutional capacity and competence in the proposed area of work is provided;
   4. Support personnel, facilities, and instrumentation are sufficient;
   5. A clear plan is articulated for project management, including time allocated for attainment of objectives and delivery of products, maintenance of partnerships and collaborations, and a strategy to enhance communication, data sharing, and reporting among members of the project team; and
   6. The budget clearly allocates sufficient resources to carry out a set of research, education (teaching), and/or extension activities that will lead to desired outcomes, with no more than two-thirds of the budget focused on a single project component. Supporting funds for Community of Practice core functions and project-specific activities are included for partnerships with eXtension.

c. Project Relevance
   1. Documentation that the project is directed toward specific Program Area Priority identified in this RFA and is designed to accelerate progress toward the productivity and economic, environmental, and social sustainability of U.S. agriculture with respect to natural resources and the environment, human health and well-being, and communities;
   2. Project components (research, education, and/or extension) – at least two are required – are fully integrated and necessary to address the problem or issue;
   3. The proposed work addresses identified stakeholder needs;
   4. Stakeholder involvement in project development, implementation, and evaluation is demonstrated, where appropriate;
   5. Plan and methods for evaluating success of project activities and documenting potential impact against measurable short and mid-term outcomes are suitable and feasible;
   6. For extension or education (teaching) activities, curricula and related products will sustain education or extension functions beyond the life of the project; and
   7. For extension or education (teaching) activities, the resulting curricula or products share information and recommendations based on knowledge and conclusions from a broad range of research initiatives.

d. Center of Excellence Status
   1. All eligible applicants will be competitively peer reviewed (as described in Part V, A. and B. of this RFA), and ranked in accordance with the evaluation criteria. Those that rank highly meritorious and requested to be considered as a center of excellence will be further evaluated by the peer panel to determine whether they

have met the standards to be centers of excellence (Part III D. and Part IV C.). In instances where they are found to be equally meritorious with the application of a non-center of excellence, based on peer review, selection for funding will be weighed in favor of applicants meeting the center of excellence criteria. NIFA will effectively use the center of excellence prioritization as a "tie breaker". Applicants that rank highly meritorious but who did not request consideration as a center of excellence or who are not deemed to have met the centers of excellence standards may still receive funding .

In addition, the applicant's Notice of Award will reflect that, for the particular grant program, the applicant meets all of the requirements of a center of excellence. Entities recognized as centers of excellence will maintain that distinction for the duration of their period of performance or as identified in the terms and conditions of that award.

3. Conference Grant Applications
   a. Relevance of the proposed conference to agriculture and food systems in the U.S. and appropriateness of the conference in fostering scientific exchange;
   b. Qualifications of the organizing committee and appropriateness of invited speakers to topic areas being covered; and
   c. Uniqueness, timeliness of the conference, and appropriateness of budget requests.

4. Exploratory Research Applications
   a. The scientific merit of the proposed activity;
   b. Appropriateness of the grant for developing proof of concept of new and untested ideas including high risk research;
   c. The applicant's previous experience and background along with the proposed activities; and
   a. Relevance of the project to sustainable U.S. agriculture, the environment, human health and well-being, and rural communities.

5. New Investigator Grant Applications
Refer to the review criteria listed above for the applicable Project Type (Research or Integrated) to which you are applying.

6. Sabbatical Grant, Equipment Grant, and Seed Grant Applications
   a. The merit of the proposed activities or equipment as a means of enhancing the capabilities and competitiveness of the applicant and/or institution;
   b. The applicant's previous experience and background along with the appropriateness of the proposed activities or equipment for the goals proposed; and
   c. Relevance of the project to long-range improvements in and sustainability of U.S. agriculture, the environment, human health and well-being, and rural communities.

7. Predoctoral and Postdoctoral Fellowship Applications
   a. Merit of the Application for Science Research, Education, and/or Extension
      i. Novelty, multidisciplinary innovation, uniqueness, originality, and advancing current knowledge;

ii.   Conceptual adequacy of the research, education, and/or extension, as applicable;

iii. Project objectives and outcomes are clearly described and measurable, adequate, and appropriate;

iv.   Proposed approach, procedures, or methodologies are appropriate, clearly described, suitable, and feasible;

v.   The predoctoral or postdoctoral fellow has documented achievement of high educational quality and excellence (*e.g.,* GRE score, GPA, list of scholarly activities, honors, professional society membership, *etc.)*

vi.   Appropriate educational opportunities and curriculum plan for proposed area of study.

vii. Novelty and innovation in the training and career development plans supports the career trajectory of the Fellows and provides sufficient time to obtain teaching credentials or competencies

b. Qualifications of Project Personnel, Adequacy of Facilities, and Project Management

i.   Roles of the Fellow(s), mentor(s), and other key personnel are clearly defined;

ii.   Assessment of predoctoral or postdoctoral applicants': critical thinking and analytical skills based on organization and details provided in the application; ability to develop into a leader in the food and agricultural sciences; level of maturity of thought, alignment between career goals and objectives and appropriate activities and opportunities presented to achieve those goals; documented achievement of high educational quality and excellence (*e.g.,* GPA, GRE, publications, presentations, awards); appropriate educational opportunities, mentoring, and curriculum plan for proposed area of study;

iii. Fellow(s), along with mentor(s) and other key personnel, have sufficient preparation/expertise to ensure successful completion of the proposed project, and where appropriate, partnerships with other relevant disciplines and institutions are established;

iv.   Evidence provided that the proposed work is original and developed by the applicant in consultation with other key personnel;

v.   Evidence that the identified institution has capacity and competence in the proposed area of work and support personnel, facilities, and instrumentation are sufficient;

vi.   A clear plan is articulated for project management, including time allocated for attainment of objectives, responsibilities for deliverables, and delivery of products;

vii. Appropriate mentor engagement and training in research, education, and/or extension is described.

c. Project Relevance

i.   Documentation that the proposed research, education, and/or extension activity is directed toward specific Program Area Priorities identified in this RFA;

ii.   Plan and methods for evaluating success of project activities and documenting potential impact against measurable short and mid-term outcomes are suitable and feasible;

iii. Science-based knowledge, skills, and capabilities gained are related to the NIFA foundational programs and challenge areas and will enhance and sustain human capital beyond the life of the project; and

iv. Potential of the proposed project and training in serving as a good foundation for the applicant predoctoral or postdoctoral fellow to complete PhD degrees or provide the requisite, individualized and mentored experiences that will develop his/her research skills that help them become independent and productive scientists.

D. Conflicts of Interest and Confidentiality

During the peer evaluation process, we take extreme care to prevent any actual or perceived conflicts of interest that may impact review or evaluation. For the purpose of determining conflicts of interest, we determine the academic and administrative autonomy of an institution by reference to the current Higher Education Directory, published by Higher Education Publications, Inc., 1801 Robert Fulton Drive, Suite 555, Reston, VA, 20191. Phone: (888) 349-7715. Web site: http://www.hepinc.com.

Names of submitting institutions and individuals, as well as application content and peer evaluations, are kept confidential, except to those involved in the review process, to the extent permitted by law. In addition, the identities of peer reviewers will remain confidential throughout the entire review process, to the extent permitted by law; therefore, the names of the reviewers will not be released to applicants.

E. Organizational Management Information

Specific management information relating to an applicant shall be submitted on a one time basis, with updates on an as needed basis. This requirement is part of the responsibility determination prior to the award of a grant identified under this RFA, if such information has not been provided previously under this or another NIFA program. We will provide you copies of forms recommended for use in fulfilling these requirements as part of the pre-award process. Although an applicant may be eligible based on its status as one of these entities, there are factors that may exclude an applicant from receiving federal financial and non-financial assistance and benefits under this program (e.g., debarment or suspension of an individual involved or a determination that an applicant is not responsible based on submitted organizational management information).

F. Application Disposition

An application may be withdrawn at any time before a final funding decision is made regarding the application; however, withdrawn applications normally will not be returned. One copy of each application that is not selected for funding, including those that are withdrawn, will be retained for a period of three years.